Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application.

Listing of Claims:

1. (Previously presented) A method of treating a subject with cancer by administration of a macrocyclic metal chelate, said method comprising the steps of:

(a) administering to said subject an antibody comprising an antigen recognition domain that recognizes said macrocyclic metal chelate,

wherein said antibody comprises:

a reactive site within the structure of the antibody that is not present in the wildtype of said antibody, wherein said reactive site is in a position within said antigen recognition domain and

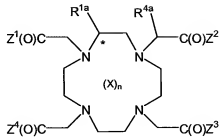
a targeting moiety that binds specifically to a cancer cell by binding with a member selected from a cell surface receptor and cell surface antigen, thereby forming a cell-antibody complex;

wherein said macrocyclic metal chelate is 1,4,7,10-tetraazacyclododecane-N,N',N",N"'-tetraacetic acid (DOTA), and comprises a reactive functional group with a reactivity complementary to said antibody reactive site; and

(b) administering to said subject said macrocyclic metal chelate, thereby forming a covalent bond between said reactive site and said reactive functional group.

2. – 5. (Canceled).

6. (Currently amended) The method of claim **1**, wherein said ~~substituted or unsubstituted DOTA~~ macrocyclic metal chelate comprises 1,4,7,10-tetraazacyclododecane-N,N',N",N"'-tetraacetic acid (DOTA) and has the formula:



wherein

R^{1a} and R^{4a} are members independently selected from H, substituted or unsubstituted alkyl, substituted or unsubstituted heteroalkyl, substituted or unsubstituted aryl and linker moieties;

X is a member selected from a lanthanide ion, an actinide ion, an alkaline earth metal ion, and a group IIIb transition metal ion;

Z^1, Z^2, Z^3 and Z^4 are members independently selected from OR^1 and NR^1R^2 in which

R^1 and R^2 are members independently selected from H, substituted or unsubstituted alkyl and substituted or unsubstituted heteroalkyl;

n is a member selected from 0 and 1.

7. (Cancelled).

8. (Previously presented) The method of claim **6**, wherein the carbon atom marked * is of S configuration.

9. (Cancelled)

10. (Previously presented) The method of claim **1**, wherein said targeting moiety binds specifically to said cell surface antigen.

11. (Original) The method of claim **1**, wherein the targeting moiety is covalently attached to said antibody.

12. (Previously presented) The method of claim **10**, wherein the targeting moiety is a second antibody.

13. (Original) The method of claim **11**, wherein the targeting moiety specifically binds to a protein on a cancer cell.

14. (Original) The method of claim **1**, wherein the subject is a mammal.

15. (Previously presented) The method of claim **14**, wherein the mammal is a human.

16. (Withdrawn) A method of *in vivo* imaging, said method comprising the steps of:

(a) administering to a subject an antibody comprising an antigen recognition domain that recognizes a macrocyclic metal chelate, wherein said antibody comprises a recognition moiety that binds specifically to a cell, thereby forming a cell-antibody complex;

(c) administering to said subject said metal chelate, thereby specifically binding said compound to said antibody to form a cell-antibody-metal chelate complex; and

(d) detecting said cell-antibody-metal chelate complex.

17. (Withdrawn) The method of claim **16**, wherein said metal chelate comprises four nitrogen atoms.

18. (Withdrawn) The method of claim **16**, wherein the step of detecting is by positron emission tomography.

19. (Withdrawn) The method of claim **16**, wherein the step of detecting is by magnetic +resonance imaging.

20. (Withdrawn) The method of claim **16**, wherein the step of detecting is by detection of lanthanide luminescence.

21. (Withdrawn) The method of claim **16**, further comprising, between steps (a) and (b), administering a clearing agent to said subject.

22. (Withdrawn) The method of claim **16**, wherein the subject is a mammal.

23. (Withdrawn) The method of claim **22**, wherein the mammal is a human.

24. (Previously presented) The method according to claim **1** wherein said antibody has the structure:

$$(Ab)_{n'}\text{-}L\text{-}T$$

wherein,

n' is an integer selected from 1 to 10 ;

Ab represents said antibody;

L is a member selected from a chemical bond and a linking group that may contain one or more functional groups; and

T is said targeting moiety.

25. (Canceled).

26. (Previously presented) The method of claim **24**, wherein said targeting moiety is a second antibody that binds specifically to a cell surface antigen.

27. (Previously presented) The method according to claim **24** wherein said antibody is administered to said subject as a pharmaceutical composition comprising said antibody and a pharmaceutically acceptable carrier.

28. (Canceled)

29. (Cancelled).

30. (Previously presented) The method according to claim **1**, wherein said cell is a cancer /*-cell.

31 (Canceled)

32. (Cancelled).

33. (Previously presented) The method according to claim **6**, wherein

R^{1a} and R^{4a} are H;

Z^1, Z^2, Z^3 and Z^4 are OH;

and n is 1.

34. (Previously presented) The method according to claim **33**, wherein said targeting moiety is a second antibody that binds specifically to a cell surface antigen.

35. (Previously presented) The method according to claim **34**, wherein said targeting moiety is anti-CEA.

36. (Previously presented) The method according to claim **33**, wherein said targeting moiety is anti-CEA.

37. (Currently amended) The method according to claim **1**, wherein said antibody has a first sequence having at least 95 ~~percent homology~~ % sequence identity with SEQ ID NO. 1; and wherein said antibody has a second sequence having at least 95 ~~percent homology~~ % sequence identity with SEQ ID NO. 5.

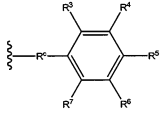
38. (Previously presented) The method according to claim **1**, wherein said reactive site comprises sulfur.

39. (Cancelled) The method according to claim **1**, wherein said antibody is purified.

40. (New) The method according to claim **6**, wherein R^{1a} is a member independently selected from substituted or unsubstituted alkyl, substituted or unsubstituted heteroalkyl, substituted or unsubstituted aryl and linker moieties.

41. (New) The method according to claim **6**, wherein R^{4a} is a member independently selected from substituted or unsubstituted alkyl, substituted or unsubstituted heteroalkyl, substituted or unsubstituted aryl and linker moieties.

42. (New) The method according to claim **6**, wherein said DOTA further comprises an arylalkyl moiety having a structure according to the formula:



wherein

R^c is an unsubstituted unbranched alkyl linker;

R^3, R^4, R^5, R^6 and R^7 are members independently selected from H, halogen, NO_2, CN, X^1R^8, NR^9R^{10}, and $C(X^2)R^{11}$,

wherein

X^1 is a member selected from O, NH, and S;

X^2 is a member selected from O, S, and NH;

R^8 and R^9 are members independently selected from H, substituted or unsubstituted alkyl, substituted or unsubstituted heteroalkyl, substituted or unsubstituted heteroalkyl and $C(Z^3)R^{12}$

wherein

Z^3 is a member selected from O, S and NH;

R^{12} is a member selected from substituted or unsubstituted alkyl, substituted or unsubstituted heteroalkyl and OR^{13}

wherein

R^{13} is a member selected from substituted or unsubstituted alkyl, substituted or unsubstituted heteroalkyl, substituted or unsubstituted aryl, and substituted or unsubstituted heteroaryl;

R^{10} is a member selected from H, substituted or unsubstituted alkyl, substituted or unsubstituted heteroalkyl, and OH, and

R^9 and R^{10} taken together are optionally (=C=S);

R^{11} is a member selected from H, halogen, substituted or unsubstituted alkyl, substituted or unsubstituted heteroalkyl, OR^{14}, and $NR^{15}R^{16}$,

wherein

R^{14} is a member selected from H, substituted or unsubstituted alkyl, substituted or unsubstituted heteroalkyl, and $C(O)R^{17}$,

wherein

R^{17} is a member selected from substituted or unsubstituted alkyl, and substituted or unsubstituted heteroalkyl; and

R^{15} and R^{16} are members independently selected from H, substituted or unsubstituted alkyl, and substituted or unsubstituted heteroalkyl.